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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/936,611	09/14/2001	Takuya Nakashima	L7016.01127	7319

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EXAMINER

CREPEAU, JONATHAN

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 03/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/936,611

Applicant(s)

NAKASHIMA ET AL.

Examiner

Jonathan S. Crepeau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 September 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9/14/01.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The translation of the International Preliminary Examination report cited on the IDS filed on September 14, 2001 has been considered but has not officially been made of record on the IDS because it is an unpublished document.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 9-283180.

Regarding claim 1, the reference teaches a non-aqueous electrolyte secondary battery (see abstract). The positive electrode comprises a lithium manganese composite oxide (see paragraph 5, section 8 of the machine translation). The negative electrode contains a material capable of occluding and releasing lithium ions (see paragraph 5, sections 5-7). Regarding claims 1 and 2, the negative electrode further contains an oxide of calcium, potassium, sodium, or strontium (see paragraph 30).

Thus, the instant claims are anticipated.

4. Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 11-111342. Regarding claim 1, the reference teaches a non-aqueous electrolyte secondary battery (see abstract). The positive electrode comprises a lithium manganese composite oxide (see paragraph 15 of the machine translation). The negative electrode contains a carbon material capable of occluding and releasing lithium ions and a calcium fluoride compound (see abstract). Regarding claim 3, the calcium compound is present in an amount of less than 10 wt% (see paragraph 6).

Thus, the instant claims are anticipated.

5. Claim 1 is rejected under 35 U.S.C. 102(a) as being anticipated by JP 2000-113877. Regarding claim 1, the reference teaches a non-aqueous electrolyte secondary battery (see abstract). The positive electrode comprises a lithium manganese composite oxide (see paragraph 32 of the machine translation). The negative electrode contains a graphite material capable of occluding and releasing lithium ions and a calcium compound (see abstract).

Thus, the instant claim is anticipated.

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6. Claims 1 and 2 are rejected under 35 U.S.C. 102(a) as being anticipated by JP 2000-12014. Regarding claim 1, the reference teaches a non-aqueous electrolyte secondary battery (see abstract). The positive electrode comprises a lithium manganese composite oxide (see paragraph 24 of the machine translation). Regarding claims 1 and 2, the negative electrode contains a material capable of occluding and releasing lithium ions and sodium or potassium metal (see paragraphs 9 and 31).

Thus, the instant claims are anticipated.

7. Claims 1 and 2 are rejected under 35 U.S.C. 102(a) as being anticipated by JP 2000-12015. Regarding claim 1, the reference teaches a non-aqueous electrolyte secondary battery (see abstract). The positive electrode comprises a lithium manganese composite oxide (see paragraph 28 of the machine translation). Regarding claims 1 and 2, the negative electrode contains a material capable of occluding and releasing lithium ions and sodium or potassium metal (see abstract and paragraph 42).

Thus, the instant claims are anticipated.

8. Claims 1 and 2 are rejected under 35 U.S.C. 102(a) as being anticipated by JP 11-343109. Regarding claim 1, the reference teaches a non-aqueous electrolyte secondary battery (see abstract). The positive electrode comprises a lithium manganese composite oxide (see paragraph

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48 of the machine translation). Regarding claims 1 and 2, the negative electrode contains a carbon material capable of occluding and releasing lithium ions and calcium or strontium metal (see abstract).

Thus, the instant claims are anticipated.

9. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 4-132174. Regarding claim 1, the reference teaches a non-aqueous electrolyte secondary battery (see abstract). The positive electrode comprises manganese oxide (see abstract), which becomes a lithium manganese composite oxide during cycling of the battery. The negative electrode contains a lithium material capable of occluding and releasing lithium ions (see abstract). Regarding claims 1 and 2, the negative electrode further contains a carbide of sodium, potassium, or calcium (see page 3, first column).

Thus, the instant claims are anticipated. It is further noted that a full translation of JP 4-132174 has been ordered and will be made available to Applicant upon request or in the next communication.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 3, 4, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 4-132174.

The reference is applied to claims 1 and 2 for the reasons stated above. However, the reference does not appear to teach the weight percentages of the sodium, potassium, or calcium compounds as recited in claims 3 and 4, or that the negative electrode is made by mixing the sodium, potassium, or calcium compound and the lithium compound and forming a slurry, as recited in claim 7.

However, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be sufficiently skilled to adjust the weight percentage of the sodium, potassium, or calcium compound in the negative electrode mixture so as to affect the resulting properties of the electrode. As shown in Figure 3 of the reference, the optimal sodium carbide content appears to be around 1%. Such a value would render claimed range of 0.01-10 wt% obvious.

Furthermore, the recitation in claim 7 that electrode is made by forming a slurry of the compounds is not considered to distinguish over the reference. Casting methods which involve slurry formation are efficient and inexpensive ways of forming electrode mixtures. As such, the artisan would be motivated to form the negative electrode of JP '174 by forming a slurry.

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12. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 9-283180 in view of Iwata et al (U.S. Patent 6,168,888).

JP '180 is applied to claims 1 and 2 for the reasons stated above. However, the reference does not expressly teach that the lithium manganese oxide is a cubic material possessing the properties recited in instant claim 5.

Iwata et al. is directed to a cubic spinel-type lithium manganese oxide containing heteroelements (see abstract). In column 2, line 48, the reference teaches that the lattice constant is between 8.19 and 8.24 angstroms. In column 2, line 63, the reference teaches that the average particle diameter is 1-50 microns and the BET surface area is 0.1-5 m²/g.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the lithium manganese oxide of Iwata et al. in the battery of JP '180. In column 1, line 51, Iwata et al. teach the following:

It is an object of the present invention to provide a high-performance spinel-type lithium-manganese oxide for use as a material for positive electrodes of a Li secondary battery with inhibited Mn dissolution in an organic electrolyte, as well as a high-performance lithium secondary battery using said lithium-manganese oxide as a positive electrode.

As such, the artisan would be motivated to use the lithium manganese oxide of Iwata et al. in the battery of JP '180, thereby rendering the subject matter of claim 5 obvious.

13. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 9-283180 in view of Wang et al (U.S. Patent 5,532,084).

JP '180 is applied to claims 1 and 2 for the reasons stated above. However, the reference does not expressly teach that the lithium manganese oxide is a rhombic system material possessing the properties recited in instant claim 6.

Wang et al. is directed to a manganese dioxide product (see abstract). In column 4, line 32, the reference teaches that the manganese dioxide is orthorhombic with lattice constants of 4.5, 9.28, and 2.87 angstroms.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the manganese dioxide of Wang et al. in the battery of JP '180. In column 2, line 23, Wang et al. teach the following:

new name) in the figures and description herein. The P-CMD product of the invention when used as cathode active material in electrochemical cells, particularly alkaline and lithium cells, provides these cells with higher capacity and energy density per gram than are obtainable from the same cells employing conventional chemical manganese dioxide (CMD) or electrolytic manganese dioxide (EMD). Additionally, the discharge voltage profiles of cells, particularly lithium cells, containing the P-CMD as cathode active material, are higher than in conventional cells employing EMD or CMD cathode material. This is very attractive in that the use of P-CMD as cathode material can result in a higher power cell. The P-CMD product is characterized by

Accordingly, the artisan would be motivated to use the manganese oxide of Wang et al. in the battery of JP '180, thereby rendering the claimed lattice constants obvious. Furthermore, the artisan would be sufficiently skilled to manipulate the average diameter and surface area of the manganese dioxide so as to fall within the claimed ranges. These parameters are known to affect

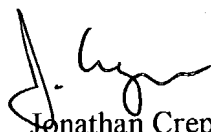
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the resulting electrochemical properties of an active material. It has been held that the discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980).

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski, can be reached at (571) 272-1302. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (703) 872-9306.


Jonathan Crepeau
Patent Examiner
Art Unit 1746
March 7, 2004